UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 31510

CSAH NO. 62

OVER THE

MISSISSIPPI RIVER

DISTRICT 1 - ITASCA COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 29)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 31510, Piers 1, 2, and 3, were found to be in good to satisfactory condition with coating failure and widespread nodular corrosion covering most of the steel pile surfaces from the waterline to the mudline. The corrosion was accompanied by only minor section loss. The split that was observed along a vertical welded seam during the previous inspection has been repaired with a bolted steel collar. The channel bottom around the substructure units appeared stable and relatively unchanged, however, minor scour depressions have developed at the upstream piles of Pier 2 since the previous inspection.

INSPECTION FINDINGS:

(A) Moderate corrosion was observed on the steel pipe piles from the waterline to the mudline. The piles exhibited minimal section loss with typical pitting penetrations of no more than 1/32 of an inch and up to a maximum of 1/16 of an inch in random instances.

(B) The vertical crack noted in the previous inspection has been adequately repaired with a bolted steel collar extending from the top of the pile to 9 feet below the waterline.

(C) Minor scour depressions, 1 to 2 feet deep with a 1 to 2 foot radius, have developed around the two upstream piles of Pier 2 since the previous inspection.

(D) A heavy accumulation of organics/vegetation with occasional timber debris was observed at the upstream nose and along the entire bank side of Pier 3 from the channel bottom to 4 feet above the channel bottom. Scattered steel and timber debris was also observed on the channel bottom at Pier 2 along with a 55 gallon drum at both Piers 1 and 2.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 31510

Feature Crossed: The Mississippi River

Feature Carried: CSAH No. 62

Location: District 1 - Itasca County

Bridge Description: The superstructure consists of four spans of multiple prestressed concrete beams. The superstructure is supported by two reinforced concrete abutments and three steel pipe pile piers. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matt J. Lengyel

Date: August 23, 2002

Weather Conditions: Overcast, " 65E F

Underwater Visibility: " 5 Feet

Waterway Velocity: " 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: Piers 1 and 3 consist of a single line of 10 steel pipe piles supporting a reinforced concrete cap. Pier 2 consists of two lines of 5 steel pipe piles supporting a reinforced concrete cap.

Maximum Water Depth at Substructure Inspected: Approximately 13.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the east end of Pier 3.

Water Surface: The waterline was approximately 7.9 feet below reference.
Waterline Elevation = 1273.1.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

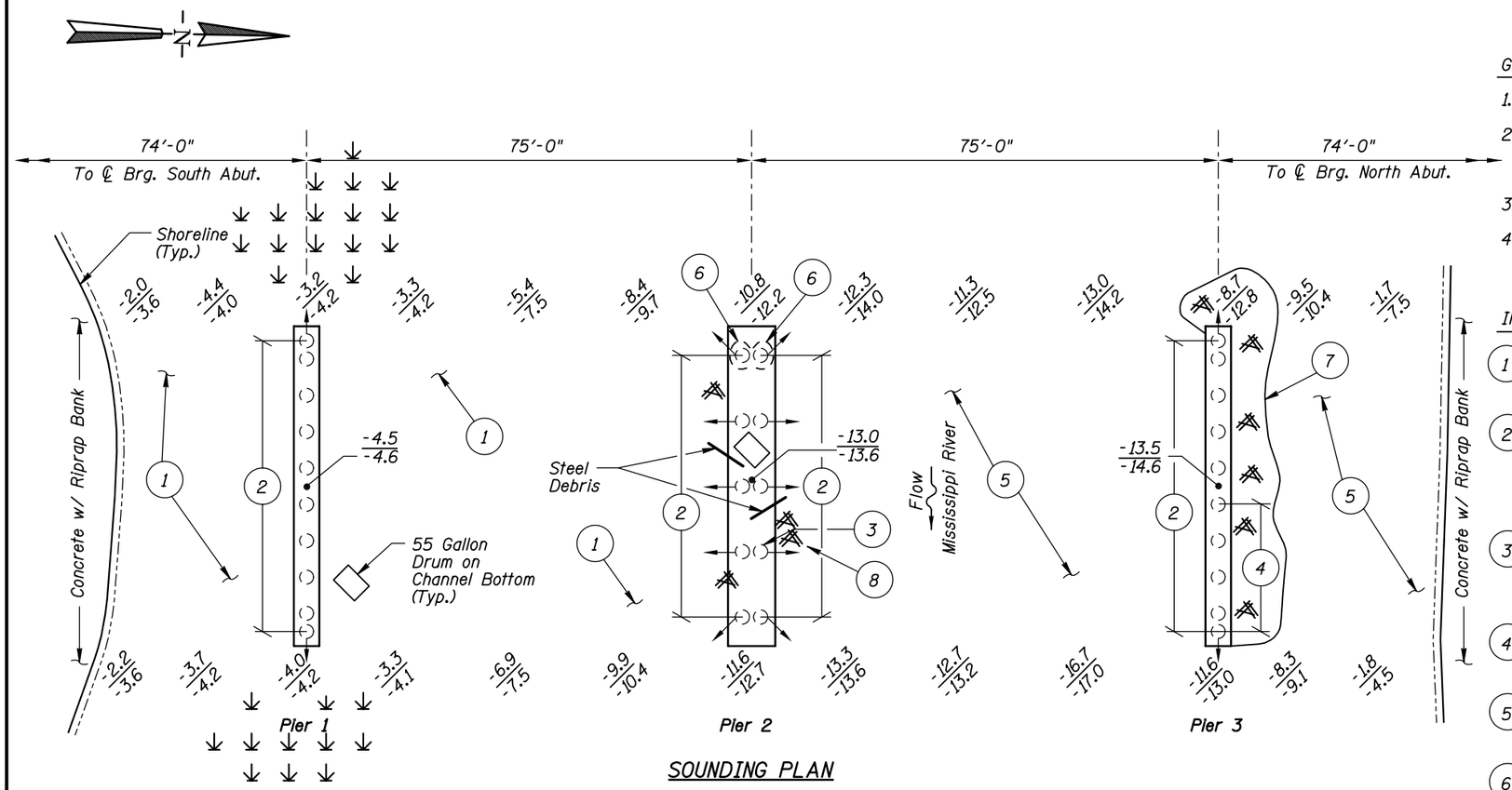
Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 8

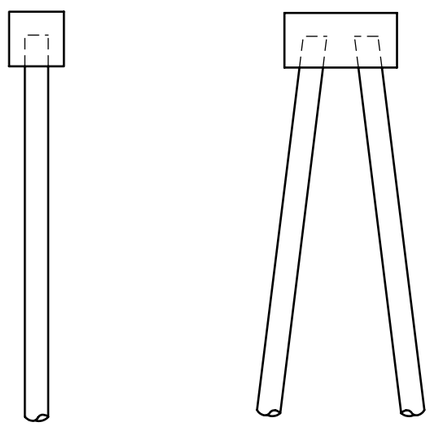
Item 92B: Underwater Inspection: Code B/08/02

Item 113: Scour Critical Bridges: Code R/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.
_____ Yes __X__ No



SOUNDING PLAN



PIERS 1 & 3 END VIEW

PIER 2 END VIEW

GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on August 23, 2002, the waterline was located approximately 7.9 feet below the top of pier cap at east end of Pier 3. This corresponds to a waterline elevation of 1273.1 feet based on previous report dated 8/25/97.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between substructure units

INSPECTION NOTES:

(1) The channel bottom material consisted of soft silty sand with maximum probe rod penetrations of 1 foot.

(2) Moderate corrosion covered 75 to 100 percent of the pile surfaces from the waterline to the mudline. Minimal section loss was observed with typical pitting penetrations of no more than 1/32 inch and up to a maximum of 1/16 inch in random instances.

(3) Vertical crack along welded joint noted in previous inspection, August 27, 1997, has been repaired with a bolted steel collar extending from the underside of the pile cap to 9 feet below the waterline.

(4) Random heavy rust nodules extending from 3 feet below the waterline to the mudline.

(5) The channel bottom material consisted of firm sandy gravel with 6 inch to 2 foot diameter rocks and probe rod penetrations of 2 to 4 inches.

(6) Minor scour depressions, 1 to 2 foot deep with 1 to 2 foot radius, were observed around the upstream piles of Pier 2.

(7) Heavy accumulation of organics/vegetation was observed at the upstream nose and along the entire bank side of Pier 3 with occasional 1 foot diameter timber debris from the mudline up 3 to 4 feet above the channel bottom.

(8) Minor accumulation of 1 foot diameter timber debris was scattered on the channel bottom along the bent.

Legend

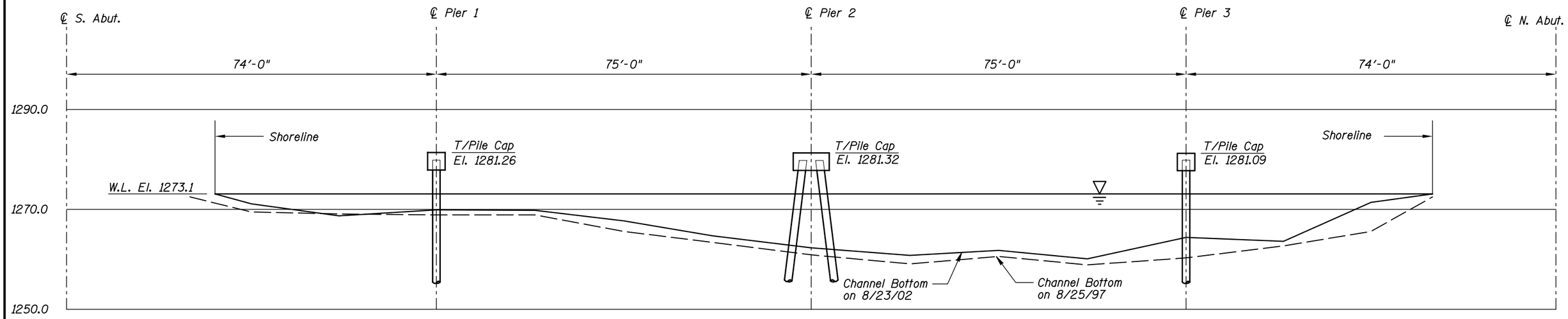
-2.2 / -3.0	Sounding Depth from Waterline (8/23/02) / Sounding Depth from Waterline (8/25/97)
	Steel Pipe Pile
	Battered Steel Pipe Pile
	Vegetation/Grass
	Timber Debris
	Scour Depression

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

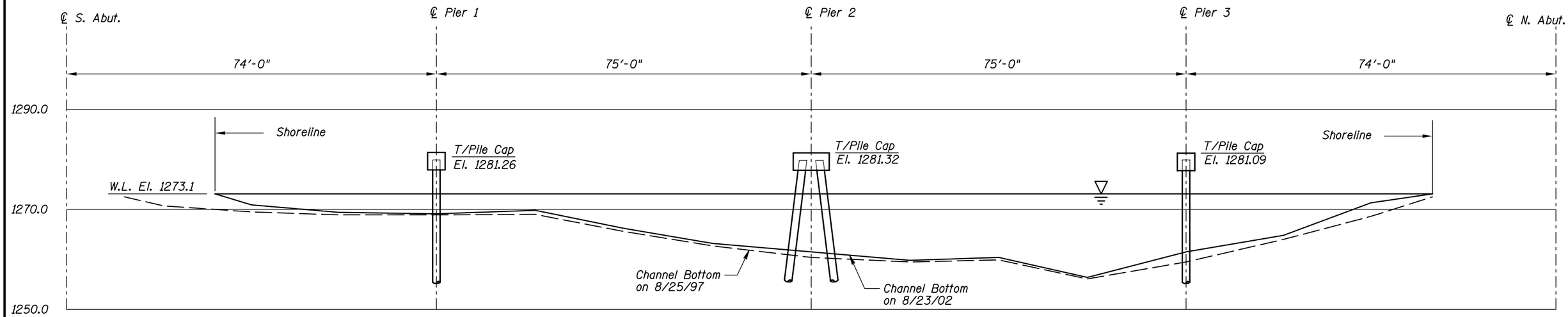
STRUCTURE NO. 31510
OVER THE MISSISSIPPI RIVER
DISTRICT 1, ITASCA COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120029		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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OVER THE MISSISSIPPI RIVER
DISTRICT 1, ITASCA COUNTY

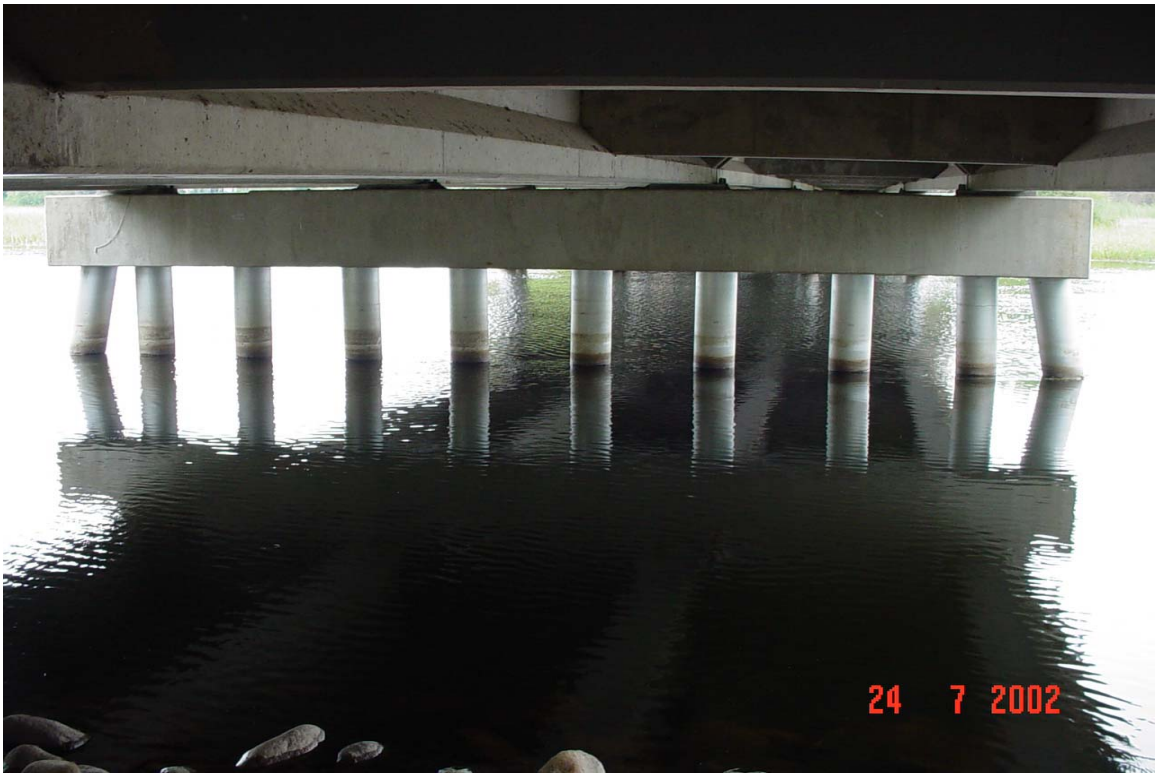
UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=20'
Code: 35120029		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Southeast.

Photograph 2. View of Pier 1, Looking North.

Photograph 3. View of Pier 2, Looking Southeast.



Photograph 4. View of Pier 3, Looking South.

Photograph 5. View of Repair of Pile at Pier 2, Looking Southwest.

Photograph 6. Overall View of the Structure, Looking Southwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 23, 2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E.
BRIDGE NO: 31510 WEATHER: Overcast, "65E F
WATERWAY CROSSED: The Mississippi River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Matt J. Lengyel
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, and Probe Rod
TIME IN WATER: 11:00 A.M.
TIME OUT OF WATER: 11:35 A.M.
WATERWAY DATA: VELOCITY "0.5 f.p.s.
VISIBILITY "5 Feet
DEPTH "13.0 feet at Pier 2 and "13.5 feet at Pier 3
ELEMENTS INSPECTED: Piers 1, 2, and 3.
REMARKS: Overall, the submerged steel of the piles was in good to satisfactory condition with coating failure and nodular corrosion from the waterline to the mudline. Thus far, the corrosion has caused minimal section loss with most of the related pitting exhibiting penetrations of no more than 1/32 inch. In rare instances, the pitting was up to 1/16 inch deep. There was scattered steel debris and/or timber drift on the channel bottom at each of the piers with a heavy (up to 4 foot high) accumulation of organic material and vegetation along the upstream and bank sides of Pier 3. Previously noted crack in pile weld at Pier 2 has been adequately repaired with a bolted collar.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 31510
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED The Mississippi River

INSPECTION DATE August 23, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	4.5’	6	6	N	9	N	6	8	N	N	7	8	N	6	N	6	N	N
	Pier 2	13.0’	6	6	N	9	N	6	8	N	N	7	8	N	6	N	6	7	N
	Pier 3	13.5’	6	6	N	9	N	6	8	N	N	6	7	N	6	N	6	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged steel of the piles was in good to satisfactory condition with coating failure and nodular corrosion from the waterline to the mudline. Thus far, the corrosion has caused minimal section loss with most of the related pitting exhibiting penetrations of no more than 1/32 inch. In rare instances, the pitting was up to 1/16 inch deep. There was scattered steel debris and/or timber drift on the channel bottom at each of the piers with a heavy (up to 4 foot high) accumulation of organic material and vegetation along the upstream and bank sides of Pier 3. Previously noted crack in pile weld at Pier 2 has been adequately repaired with a bolted collar.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.